

# PATENT ABSTRACTS OF JAPAN

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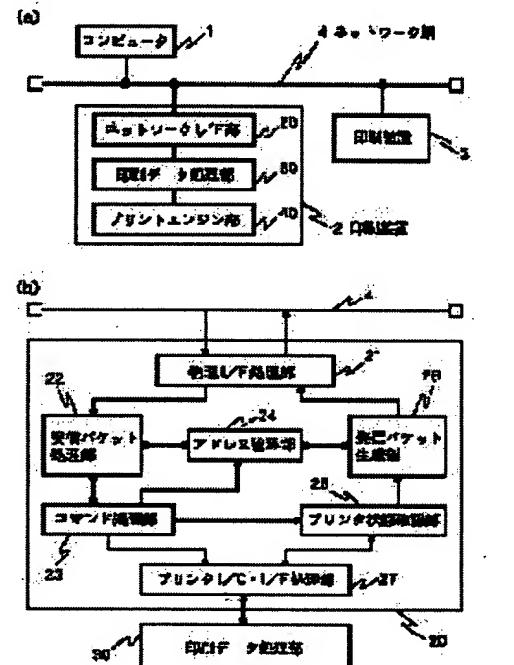
(22)Date of filing : 26.07.1994 (72)Inventor : SHIBUI SUMIO

## (54) PRINTING SYSTEM

### (57)Abstract:

PURPOSE: To provide a printing system which is capable of efficiently performing a simultaneous printing of plural printers connected to a network.

CONSTITUTION: Plural computers 1 and plural printers 2 and 3 are connected to a network 4 via a network interface means 20, and the network interface means 20 of the plural printers 2 and 3 has a packet reception means 22, an address control means 24, a command processing means 23, a confirmation means 25 and a packet transmission means 26. When a computer 1 makes plural printers 2 and 3 perform a simultaneous printing, the printers which are made to perform the simultaneous printing are designated in advance, only the printers for which the simultaneous printing is designated are prepared for the simultaneous printing, printing data are transmitted by defining all the printers as objects, only the printers for which the simultaneous printing is designated receive printing data and perform the printing.



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**CLAIMS**

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**[Claim(s)]**

[Claim 1] Two or more computers equipped with a network interface means, It has the network network to which two or more airline printers equipped with a network interface means, and these two or more computers and these two or more airline printers are connected through this network interface means. In the printing system which performs transmission and reception of the information on this network screen oversize using a packet Said network interface means receives said packet, and memorizes the sending agency address and the destination address which were specified by part for the data division of said packet which received. The address management tool which specifies this packet that receives with this memorized destination address, The packet receiving means which said packet applicable to said destination address specified by said address management tool also receives, According to the condition of the airline printer concerned which a command-processing means to store the said dispatch former address and said destination address in said address management tool, a check means to check the condition of the airline printer concerned, and said check means checked the printing system characterized by having a packet dispatch means to carry out reading appearance of the said dispatch former address memorized by said address management tool, and to answer said computer of the dispatch origin concerned in the condition of the airline printer concerned.

[Claim 2] In case the 1st computer of said two or more computers performs simultaneous printing which makes at least two the 2nd thru/or the Nth airline printer in said two or more airline printers print the same content Said packet which has directions of said simultaneous printing beforehand is transmitted only to said the 2nd thru/or Nth airline printer. The carrier beam above 2nd thru/or the Nth airline printer directions of said simultaneous printing, respectively Prepare said simultaneous printing, and said 1st computer transmits print data to said all airline printers, and only said the 2nd thru/or Nth airline printer which prepared said simultaneous printing receives said print data. The printing system according to claim 1 by which each of said the 2nd thru/or Nth airline printer prints.

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**DETAILED DESCRIPTION**

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**[Detailed Description of the Invention]****[0001]**

[Industrial Application] Especially this invention relates to the printing system which consisted of a computer connected with the network network, and two or more airline printers about a printing system.

**[0002]**

[Description of the Prior Art] In the conventional printing system, when a print was passed to two or more of its posts, after outputting a part with an airline printer, need number of copies was copied, or need number of copies was printed beforehand, and it was distributing to each post. Moreover, maintenance of a network network is advanced and it has come to be able to perform distribution of a print through a network network in recent years.

**[0003]**

[Problem(s) to be Solved by the Invention] However, also in printing through this network network, when a printout was performed to two or more airline printers of each, there was inconvenience that the same print data had to be sent according to an individual in a transmitting-side computer to an airline printer.

[0004] Moreover, also in the print server which mediates print data with a network network, two or more print data according to individual had to be held, and there was inconvenience that print server capacity increased.

[0005] Furthermore, in invention of the printer control system currently indicated by JP,3-126125,A, for example, in order to send the print data according to individual through a network network, a print server will be occupied, and there was inconvenience that other printings became slow.

[0006] This invention aims at offering the printing system which can perform efficiently simultaneous printing to two or more airline printers connected to the network network in view of such a point.

**[0007]**

[Means for Solving the Problem] In order to solve the trouble mentioned above, the printing system of this invention Two or more computers equipped with a network interface means, It has the network network to which two or more airline printers equipped with a network interface means, and these two or more computers and these two or more airline printers are connected through this network interface means. It is the printing system which performs transmission and reception of the information on this network screen oversize using a packet. Said network interface means receives said packet, and memorizes the sending agency address and the destination address which were specified by part for the data division of said packet which received. The address management tool which specifies this packet that receives with this memorized destination address, The packet receiving means which said packet applicable to said destination address specified by said address management tool also receives, According to the condition of the airline printer concerned which a command-processing means to store the said dispatch former address and said destination address in said address management tool, a check means to check the condition of the airline printer concerned, and said check means checked it has a packet dispatch means to carry out reading appearance of the said dispatch former address memorized by said address management tool, and to answer said computer of the dispatch origin concerned in the condition of the airline printer concerned.

[0008] The printing system of above-mentioned this invention the 1st computer of said two or more computers In case simultaneous printing which makes at least two the 2nd thru/or the Nth airline printer in said two or more airline printers print the same content is performed Said packet which has directions of said simultaneous printing beforehand is transmitted only to said the 2nd thru/or Nth airline printer. The carrier beam above 2nd thru/or the Nth airline printer directions of said simultaneous printing, respectively Said simultaneous printing is prepared, said 1st computer transmits print data to said all airline printers, only said the 2nd thru/or Nth airline printer which prepared said simultaneous printing receives said print data, and each of said the 2nd thru/or Nth airline printer prints.

[0009]

[Function] The printing system of this invention the network interface means of two or more airline printers In case it has a packet receiving means, an address management tool, a command-processing means, a check means, and a packet dispatch means and simultaneous printing is carried out to two or more airline printers from a computer, the airline printer to which simultaneous printing is made to carry out beforehand is specified. Since only the airline printer which only the airline printer which had simultaneous printing specified prepared [airline printer] simultaneous printing, and print data were transmitted [airline printer] for all airline printers, and had simultaneous printing specified prints by receiving print data Simultaneous printing to two or more airline printers connected to the network network can be performed efficiently, and it has an operation that the troublesomeness at the time of distributing a print is reduced.

[0010]

[Example] Next, one example of this invention is explained with reference to a drawing. In order to make an understanding easy in this example, the case where simultaneous printing is carried out to two airline printers from one computer is explained.

[0011] Drawing 1 is the block diagram showing the printing structure of a system of one example of this invention. Drawing 1 (a) is the block diagram of the whole printing system, and drawing 1 (b) is the block diagram of the network interface section of an airline printer.

[0012] The printing system shown in drawing 1 (a) has the computer 1 which transmits print data, and the airline printers 2 and 3 to print, and has the composition that each is connected with the network network 4. An airline printer 2 has the composition of having the network interface section (it being hereafter described as the network I/F section) 20 which controls the communication link performed between computers 1 through the network network 4, the print-data processing section 30 which develops the received print data to bit data, and the print engine section 40 which receives the bit data developed in the print-data processing section 30, and performs printing processing in a form. Although the airline printer 3 is also omitted in drawing 1 (a), it has the same configuration as an airline printer 2. The network network 4 connects a computer 1 and airline printers 2 and 3, and transmits and receives information on a command, data, the address, etc. using a packet.

[0013] The detailed configuration of the network I/F section 20 shown in drawing 1 (a) is explained using drawing 1 (b). The network I/F section 20 has the composition of having the physical interface processing section (it being hereafter described as the physical I/F processing section) 21 which controls an electrical signal, the receive-packet processing section 22, the command-processing section 23, the address Management Department 24, the printer condition check section 25, the dispatch packet generation section 26, and the printer I/O interface processing section (it being hereafter described as printer I/O and the I/F processing section) 27.

[0014] The physical I/F processing section 21 receives the packet transmitted from the computer 1 through the network network 4, and stores it in the receive-packet processing section 22. The receive-packet processing section 22 takes out the sending agency address and a destination address from the packet which received, is stored in the address Management Department 24, takes out print data, and stores them in the command-processing section 23. When a simultaneous printing command is looked for out of a packet and there is a simultaneous printing command, the command-processing section 23 takes out a simultaneous printing destination address, and gives directions of delivery and simultaneous printing after storing to the receive-packet processing section 22 and the printer condition check section 25 for a simultaneous printing command to the address Management Department 24. In the receive-packet processing section 22, the sending agency address and a

simultaneous printing destination address are read from the address Management Department 24, and reception preparations of the packet transmitted from the computer applicable to the sending agency address and the simultaneous printing destination address which were read are made. Moreover, the command-processing section 23 stores print data in printer I/O and the I/F processing section 27. The address Management Department 24 manages the sending agency address and the simultaneous printing destination address of a receive packet. The printer condition check section 25 will pass the information on the printing propriety condition of an airline printer to the print-data processing section 30 after checking the condition of an airline printer through printer I/O and the I/F processing section 27 at the dispatch packet generation section 26, if a simultaneous printing command is received from the command-processing section 23. The dispatch packet generation section 26 answers a computer 1 in the information on the printing propriety condition of an airline printer through the physical I/F processing section 21 and the network network 4 after referring to the sending agency address of the receive packet stored in the address Management Department 24. Printer I/O and the I/F processing section 27 control the communication link of the print data between the print-data processing sections 30, or the condition of an airline printer.

[0015] Next, drawing 2, drawing 3, and drawing 4 are made to correspond with drawing 1, and actuation of this example is explained. Drawing 2 is a flow chart which shows the communications processing procedure in a computer. Drawing 3 is a flow chart which shows the communications processing procedure in an airline printer. Drawing 4 is drawing showing the example of a data configuration of the packet transmitted from a computer. The packet transmitted from a computer 1 in case simultaneous printing is performed, as shown in drawing 4 includes the simultaneous printing command and the simultaneous printing destination address.

[0016] The communications processing procedure by the side of the computer of drawing 2 is explained. A computer 1 transmits the packet shown in the airline printer 2 which is an airline printer for simultaneous printing at drawing 4 (S101), and waits for the response of the propriety of the print-data reception from an airline printer 2 (S102). After processing termination of the reception preparation later mentioned in an airline printer 2, if a computer 1 receives the response ready for receiving from an airline printer 2, a simultaneous printing command will be transmitted also to the airline printer 3 which is similarly an airline printer for simultaneous printing (S103), and it will wait for the response of the propriety of the print-data reception from an airline printer 3 (S104). And if a computer 1 receives the response ready for receiving from all the airline printers for simultaneous printing after processing termination of reception preparation in all the airline printers for simultaneous printing (this example airline printers 2 and 3), the first print data will be transmitted to an airline printer 2 (S105), and it will wait for the response of the print-data reception from all the airline printers for simultaneous printing (S106). After processing termination of the simultaneous print-data reception later mentioned in all the airline printers for simultaneous printing, if a computer 1 receives the reception response from all the airline printers for simultaneous printing, the following print data will be transmitted and it will wait for the response of the print-data reception from all the airline printers for simultaneous printing. The same processing is repeated and the last print data (print-data n) are transmitted (S107), and if the response of waiting (S108) and reception is received for the response of the print-data reception of after processing termination of simultaneous printing and a computer 1 from all the airline printers for simultaneous printing in all the airline printers for simultaneous printing, it will end.

[0017] The communications processing procedure by the side of the airline printer of drawing 3 is explained. If the receive-packet processing section 22 of an airline printer 2 receives the packet transmitted from the computer 1 through the physical I/F processing section 21, takes out a destination address and it checks that it is a packet addressed to self-equipment, it stores the sending agency address and a destination address in the address Management Department 24, and stores print data in the command-processing section 23 (S200). The stored destination address investigates whether it is the usual address (that is, are they the transmission from other computers, and transmission from a computer 1?) (S201), and if it is the usual destination address, it will investigate whether the command-processing section 23 has a simultaneous printing command in the packet which received (S202). When there is a simultaneous printing command, a simultaneous printing destination address is taken out, and it stores in the address Management Department 24 (S203), and

notifies that the simultaneous printing command was required of delivery and simultaneous printing at the receive-packet processing section 22 and the printer condition check section 25 (S204). if a simultaneous printing command is received from the command-processing section 23, the receive-packet processing section 22 will be prepared so that reading appearance of the sending agency address and the simultaneous printing destination address is carried out from the address Management Department 24, and priority may be given to the packet transmitted from the computer applicable to the sending agency address and the simultaneous printing destination address which carried out reading appearance and it may receive (S205). The printer condition check section 25 answers the print-data processing section 30 to a computer 1 after checking the condition of an airline printer through the dispatch packet generation section 26 and the physical I/F processing section 21 through printer I/O and the I/F processing section 27 in the propriety of print-data reception (S206). Reception preparations from S202 to S206 are processed, and the condition of standing by reception of simultaneous print data is called a simultaneous print mode. In other words, a simultaneous printing command is received and it is in the condition which can receive simultaneous print data after setting up the address of a receive packet.

[0018] When a packet is received at the time of a simultaneous print mode (S200), a destination address is about whether it is the usual address (that is, in the transmission from other computers). the transmission from a computer 1 -- it is -- it investigating (S201), and, if it is not the usual destination address, and it is transmission from a computer 1 namely, -- The packet which the destination address investigated [ (whether simultaneous print data were transmitted) and ] whether it was a simultaneous printing destination address (S207), and received when it was not a simultaneous printing destination address is discarded (S208). If it is a simultaneous printing destination address, the received print data are stored in printer I/O and the I/F processing section 27 from the command-processing section 23 (S209), and it investigates whether reception of the packet (print data) transmitted from the computer 1 was completed (S210). Reception of a packet is repeated if reception of the packet transmitted from a computer 1 is not completed (S200 thru/or S210).

[0019] Moreover, it checks that it checks that the sending agency addresses are other computers (S201), and there is no simultaneous printing command into the received print data when there is a Request to Send from other computers at the time of a simultaneous print mode (S202), and self-equipment investigates whether it is a simultaneous print mode (S213), the packet transmitted from other computers when it was not a simultaneous print mode is received, and it prints (S214). If it is a simultaneous print mode, BUSY information will be answered to the computer of a sending agency via the dispatch packet generation section 26, and reception will be suspended (S215).

[0020] Since an airline printer 3 is also an airline printer for simultaneous printing, after setting it as a simultaneous print mode like an airline printer 2 (S200 thru/or S206), the packet transmitted from the computer 1 is received (S200), a destination address investigates whether it is the usual address (S201), and a destination address investigates whether they are the simultaneous print data to an airline printer 2 (S207). The packet which received when the packets which received were not simultaneous print data is discarded (S208), if it is simultaneous print data, print data will be taken out, and it stores in printer I/O and the I/F processing section 27 (S209), and investigates whether reception of the packet (print data) transmitted from the computer 1 was completed (S210). Reception is repeated if reception of the packet transmitted from a computer 1 is not completed (S200 thru/or S210).

[0021] After receiving all the print data transmitted from the computer 1, airline printers 2 and 3 perform printing processing (S212).

[0022]

[Effect of the Invention] As explained above, this invention the network interface means of two or more airline printers In case it has a packet receiving means, an address management tool, a command-processing means, a check means, and a packet dispatch means and simultaneous printing is carried out to two or more airline printers from a computer, the airline printer to which simultaneous printing is made to carry out beforehand is specified. When only the airline printer which had simultaneous printing specified prepares simultaneous printing, print data are transmitted for all airline printers and only the airline printer which had simultaneous printing specified prints by receiving print data Simultaneous printing to two or more airline printers connected to the network

network can be performed efficiently, and it has the effectiveness that the troublesomeness at the time of distributing a print is reduced. Moreover, reduction of the storage capacity of a computer and reduction of the traffic of a network network are measured, and it has the effectiveness that the utilization effectiveness of a network network can be gathered.

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**DESCRIPTION OF DRAWINGS**

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[Brief Description of the Drawings]

[Drawing 1] The block diagram showing the printing structure of a system of one example of this invention

[Drawing 2] The flow chart which shows the communications processing procedure in a computer

[Drawing 3] The flow chart which shows the communications processing procedure in an airline printer

[Drawing 4] Drawing showing the example of a data configuration of the packet transmitted from a computer

[Description of Notations]

1 Computer

2 Three Airline printer

4 Network Network

20 Network I/F Section

21 Physical I/F Processing Section

22 Receive-Packet Processing Section

23 Command-Processing Section

24 Address Management Department

25 Printer Condition Check Section

26 Dispatch Packet Generation Section

27 Printer I/O and I/F Processing Section

30 Print-Data Processing Section

40 Print Engine Section

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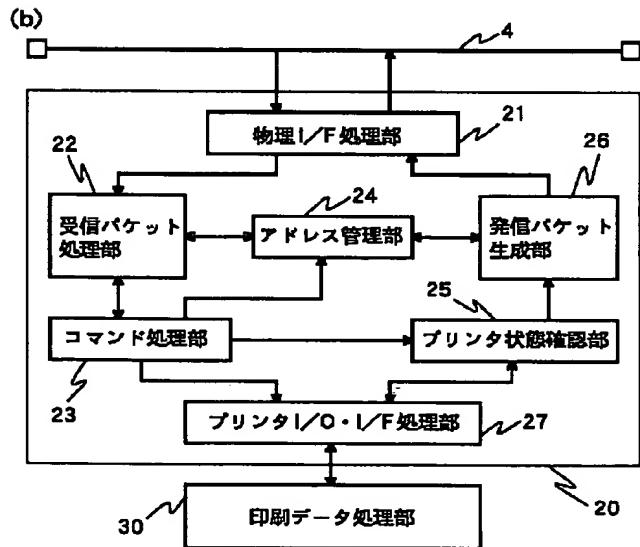
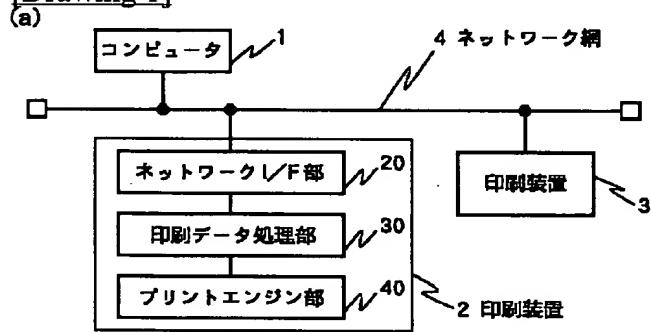
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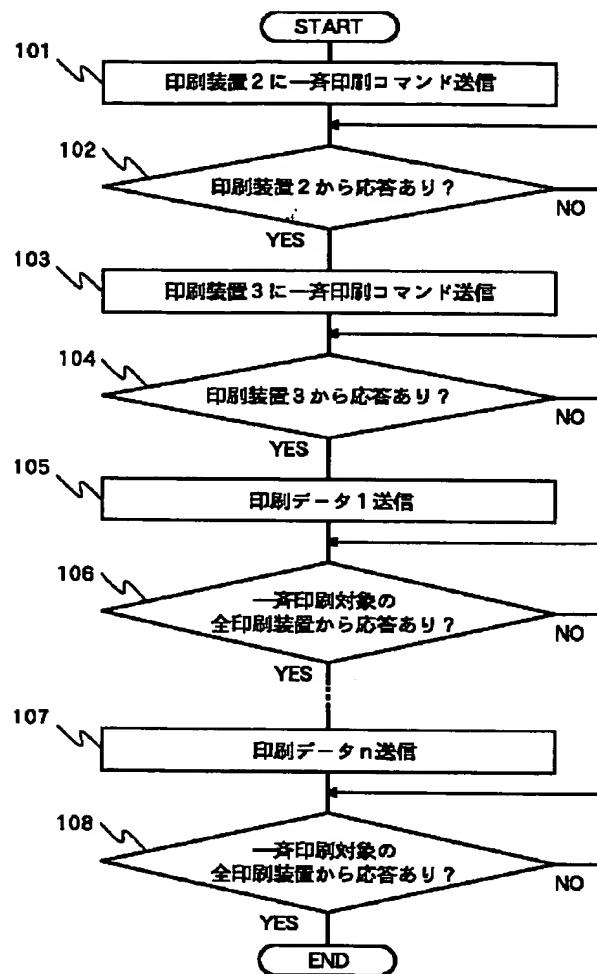
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## DRAWINGS

## [Drawing 1]

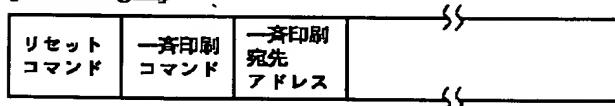


## [Drawing 2]

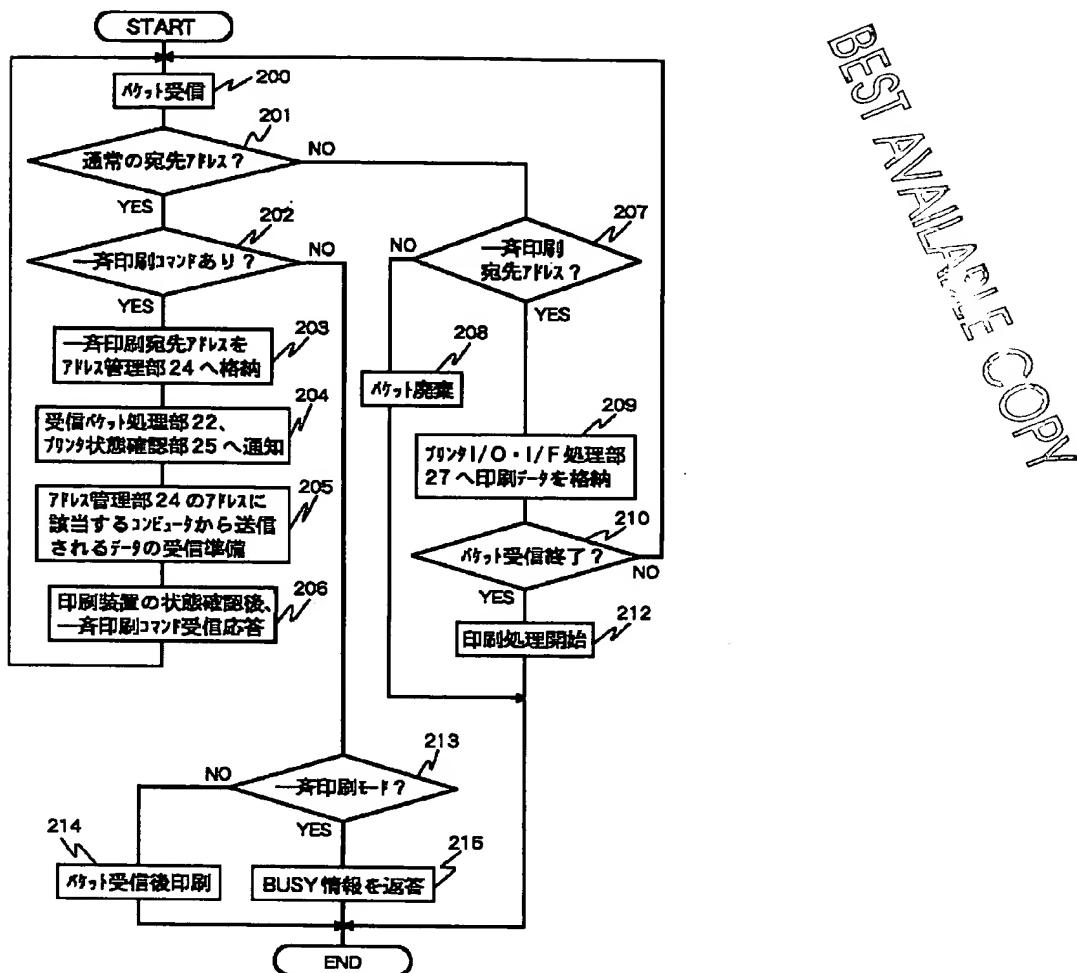


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[Drawing 4]



[Drawing 3]



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